CLAIMS

What is claimed is:

1. A method for evaluating a signal output of a mass air flow sensor for an engine, the signal having a frequency indicative of mass air flow past the sensor, said method comprising:

monitoring the signal output over a plurality of time intervals to determine a plurality of mass air flow values;

integrating said mass air flow values over said time intervals to obtain a running sum; and

dividing said running sum by a total of said time intervals to determine a net mass air flow.

2. The method of claim 1 further comprising using edges of the signal to define said time intervals.

3. The method of claim 2 further comprising defining said time intervals relative to a cylinder event of the engine.

4. The method of claim 1 wherein said integrating step comprises:

using one of said time intervals to obtain, from a table stored in a memory associated with a processor, a corresponding mass air flow value;

multiplying said corresponding mass air flow value by said one of said time intervals to determine an incremental air mass value; and

combining said incremental air mass value into said running sum.

5. The method of claim 4 wherein said integrating step further comprises using a trapezoidal method to determine said incremental air mass value.

6. The method of claim 1 wherein said integrating step comprises using at least one of a rectangular integration method and a trapezoidal integration method.

7. A control system for controlling an engine comprising:

a mass air flow sensor that outputs a signal having a frequency indicative of mass air flow through the engine; and

a controller that:

over a plurality of time intervals, monitors the signal output to determine a plurality of mass air flow values;

integrates said mass air flow values over said time intervals to obtain a running sum; and

divides said running sum by a total of said time intervals to determine a net mass air flow.

8. The control system of claim 7 wherein said controller uses edges of the signal to define said time intervals.

9. The control system of claim 8 wherein said controller defines said time intervals relative to a cylinder event of the engine.

10. The control system of claim 7 wherein said controller comprises a memory and:

uses one of said time intervals to obtain, from a table in said memory, a corresponding mass air flow value;

multiplies said corresponding mass air flow value by the one of the time intervals to determine an incremental air mass value; and

combines said incremental air mass value into said running sum.

11. The control system of claim 10 wherein said controller uses a trapezoidal method to determine said incremental air mass value.

12. The control system of claim 7 wherein said controller uses at least one of a rectangular integration method and a trapezoidal integration method.

13. A method of evaluating output of a mass air flow sensor during a time period defined relative to a cylinder event in a motor vehicle having a controller, the sensor configured to output a digital signal having a frequency indicative of mass air flow relative to the engine, said method comprising:

determining a time interval between two consecutive rising edges of the signal;

obtaining, from a table in a memory associated with the controller, a mass air flow value corresponding to said time interval;

integrating said mass air flow value over said time interval to determine an incremental air mass value;

combining said incremental air mass value into a running air mass total;

and

dividing said running air mass total by a total of said time intervals to determine a net mass air flow;

wherein said determining, obtaining, integrating and combining are performed a plurality of times during said time period, and said dividing is performed at an end of said time period.

14. The method of claim 13 wherein integrating comprises using at least one of a rectangular method and a trapezoidal method.

15. The method of claim 13 further comprising using consecutive LORES events to define said time period.

16. The method of claim 13 further comprising defining said time period as the cylinder event.

17. A vehicle comprising:

an engine;

a mass air flow sensor that outputs a signal having a frequency indicative of mass air flow through the engine; and

a controller that:

over a plurality of time intervals, uses the output signal of said sensor to determine a plurality of mass air flow values corresponding to said time intervals;

integrates said mass air flow values to obtain a running sum; and

divides said running sum by a total of said time intervals to determine a net mass air flow.

18. The vehicle of claim 17 wherein said controller uses rising edges of the digital signal to define said time intervals.

19. The vehicle of claim 17 wherein said controller defines a total of said time intervals relative to a cylinder event of the engine.

20. The vehicle of claim 17 wherein said controller comprises a memory and:

uses one of said time intervals to obtain, from a table stored in said memory, a corresponding mass air flow value;

multiplies said corresponding mass air flow value by said one of said time intervals to determine an incremental air mass value; and

combines the incremental air mass value into said running sum.

21. The vehicle of claim 20 wherein said controller uses a trapezoidal method to determine the incremental air mass value.

22. The vehicle of claim 17 wherein said controller uses at least one of a rectangular integration method and a trapezoidal integration method.

23. A method of evaluating output of a mass air flow sensor in a motor vehicle, the sensor configured to output a signal having a frequency indicative of mass air flow relative to the motor, said method comprising:

using at least one cylinder event of the motor to define a delta time interval;

during said delta time interval, using output from the sensor to determine a plurality of mass air flow values;

integrating each of said mass air flow values over a corresponding subinterval of said delta time interval to obtain a running sum; and

dividing said running sum by said delta time interval to determine a net mass air flow.

24. The method of claim 23 further comprising using two edges of the sensor output signal to define one of said subintervals.